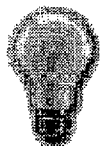


# **Exhibit D**


**Disclosure SJO8-2003-0165**

Prepared for and/or by an IBM Attorney - IBM Confidential

Created By John Thompson On 09/24/2003 10:26:57 AM MDT

Last Modified By Rosalind Kennison On 12/01/2003 02:43:57 PM MST

Required fields are marked with the asterisk (\*) and must be filled in to complete the form .

**\*Title of disclosure (in English)**

Backup by ID-suppressed mirroring then backup of target with ID reintroduced

**Summary**

Status	Final Decision (File)
Final deadline	
Final deadline reason	
Docket family	SJO9-2003-0102
Original location	TUC
* Processing location	San Jose
* Functional area	(65DA) Ed Ng-65DA
Attorney/Patent professional	Bryan W Butler/San Jose/IBM
IDT team	Clod Barrera/San Jose/IBM Brian Smith/San Jose/IBM Susan McWilliam/San Jose/IBM Jimmy Strickland/San Jose/IBM PRBAdmin/San Jose/IBM
Submitted date	09/24/2003 11:31:53 AM MDT
* Owning division	SPD
Incentive program	
Lab	
* Technology code	320
PVT score	69

**Inventors with a Blue Pages entry**

Inventors: John Thompson/Tucson/IBM

Inventor Name	Inventor Serial	Div/Dept	Inventor Phone	Manager Name
> Thompson, John G.	390226	2D/ZV0A	321-5073	Koontz, Dee Ann

&gt; denotes primary contact


**Inventors without a Blue Pages entry**
**IDT Selection**

Attorney/Patent professional Bryan W Butler/San Jose/IBM

IDT team                      Clod Barrera/San Jose/IBM  
                                     Brian Smith/San Jose/IBM  
                                     Susan McWilliam/San Jose/IBM  
                                     Jimmy Strickland/San Jose/IBM  
                                     PRBAdmin/San Jose/IBM

Response due to IP&L    10/25/2003

### \*Main Idea

To view the main idea for this disclosure, click on this doclink ---->  (If you are prompted to enter a server name, please enter D01DB068/01/A/IBM)

### \*Inventor Questions

- \* 1. Select the single most appropriate technology category for your invention from the following technologies list.

(320) Tech Tag 300 Storage Devices/Systems and Software-320 Storage management software

Comments

Are there any additional significant markets where the invention is likely to have impact?

☐ Yes ☒ No

If Yes, please identify them:

- 
- \* 2. Have you implemented the invention (e.g., made a prototype) or otherwise shown that it is workable?

☐ Yes ☒ No

If Yes, then what date

- 
- \* 3. Has the subject matter of the invention or a product incorporating the invention been offered for sale, or is it likely to be offered for sale, as part of an IBM product or service?

☐ No known product plans within 2 years

☒ Maybe; GA 1-2 years away

☐ Yes; GA within 3-12 months

☐ Yes; GA within 3 months

☐ Yes; product has been announced

What product?

DFSMS

What is the product announce or release date? (for example, you may enter the actual date, 3Q2003 or unknown)

What is the significance of the invention within the product?

☒ Improves general usability

☐ Enables a minor feature

☐ Enables a major feature

What feature?

PPRC

- 
- \* 4. Has the invention been commercially used (internally or externally) by IBM or another entity (e.g., included in or used to make products, or prototypes provided to a customer)?

☐ Yes ☒ No

If Yes, please tell us the prototype/product, and when the use first started or is scheduled to start:

---

\* 5. In what type of product might a competitor include the invention?

Disk mirroring products.

What competitor(s) (indicate home country of such competitors if not United States)?

EMC, Hitachi, STK

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\* 6. How easily can the use of the invention by a third party be detected?

- ☐ Undiscoverable; third party must admit use for IBM to know
- ☐ Difficult; e.g.; with reverse engineering or examination of available code
- ☐ With work; e.g.; using test cases; but not reverse engineering
- ☒ Easily; by running & viewing product operation
- ☐ Trivially; without purchase of product; e.g.; by reading product literature

Please propose how a test would be performed and what test methods may be required:

Run the product and then examine the contents of the secondary volume to see if the original primary volume is stored on the secondary volume.

---

\* 7. Is the invention applicable to a standard?

☐ Yes ☒ No

If Yes, what is the standard?

and Is IBM participating in the standard? ☐ Yes ☐ No

---

\* 8. Have you, or any of the other inventors, submitted this invention disclosure or a similar invention disclosure previously?

☒ Yes ☐ No

If Yes, please provide the disclosure number: TUC820000019

---

\* 9. Please list the invention disclosures (previously submitted or about to be submitted), products, patents, or publications that you and the other inventors feel are the most relevant to your invention (e.g., pertaining to the problem you are solving, including other solutions to the problem), be they from you or anyone else, or if not applicable, enter "None":

TUC820000019 -- US Patent 6,557,089

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\* 10. Was the invention made in the course of any activity that involved any other party, be it

• The government ☐ Yes ☐ No

If Yes, enter the contract number

• A customer ☐ Yes ☐ No

(such as RFQ, IGS engagement) If Yes, describe the activity

• A development ☐ Yes ☐ No

partner If Yes, describe the activity

• As part of a ☐ Yes ☐ No

standards setting activity If Yes, describe the activity

• Other persons not ☐ Yes ☐ No

employed by IBM If Yes, describe the activity

If Yes is answered to any of the above, please provide information sufficient to identify the activity (e.g.,

government contract number, company name, project name, alliance name, name of other party, client services principal, technical coordinator, etc.)

---

\* 11. Have you ever disclosed your invention to anyone outside IBM, or do you plan to do so in the future?

☐ Yes ☒ No

if Yes, please tell us whether the disclosure was (or will be) made, how made (or to be made), and whether or not there was (or is) a confidential disclosure agreement (CDA) in place covering the disclosure:

---

\* 12. If the invention relates to a product or service that is outside the scope of your business unit, please recommend IBM business unit(s), IBM location(s) or individual(s) within IBM that you think would provide a competent evaluation of your invention:

---

### Final Evaluation Questions

#### A. Threshold Questions

1. **Operability** - Is implementation of the invention possible?

Yes

Reasons for above answer:

2. **Novelty**- Are one or more concept(s) of the invention novel over what is already known in the literature, existing commercial products, patents, and earlier IBM invention disclosures?

Yes

Reasons for above answer:

#### B. Valuation Questions

1. Adequacy of description:

Clear and complete as is

Reasons for answer:

2. Technical contribution of invention:

Minor addition to known technology

Reasons for above answer:

3. Describe the problem solved/benefit provided and the implementation cost of the invention compared to existing or reasonably expected alternatives:

Minor problem/incremental benefit - minor implementation cost

4. Are any alternatives to the invention available to those wishing to avoid its use?

Alternatives have drawbacks

5. Describe the likelihood of use of the invention (answer each):

IBM's customers? Possible

IBM's suppliers/vendors? Unlikely

IBM's competitors? Definite

IBM? Definite

Reasons for above answer:

6. What % of third party products in the technical field will likely contain the invention?

50-75%

7. How long is the invention likely to be used in products by IBM or others?

10-15 years

8. How easily can use of the invention by a third party be detected?

Easily; by running & viewing product operation

Reasons for the above answer, including description of how use could be detected:

## Evaluation

This team evaluation was entered by Rosalind Kennison/San Jose/IBM on 10/17/2003

What is the team's evaluation of this disclosure? Search

Date evaluated : 10/17/2003

Evaluation comments

Final Evaluation History	Who made the final evaluation	Final evaluation date
Search	Rosalind Kennison/San Jose/IBM	10/17/2003

## Search Information

Date sent: 10/29/2003

\*Target completion date: 11/20/2003 Search results received date:

11/21/2003

Who was the search sent to (This area is to designate a Local Searcher name or WA IPL): WA IPL

\*Search type: ☒ Patentability ☐ Clearance ☐ Validity ☐ State of Art

\*Features to be searched: See disclosure.

## Search Office Information

Target completion date: 11/20/2003 ☐ Search has been delayed Ship/Return date: 11/20/2003

Search conducted by Kunkle

Comments

## Final Decision

This decision was entered by Rosalind Kennison/San Jose/IBM on 12/01/2003

Decision: File

Status: N/A

PPM area: 300 - Storage Devices/Systems/Software

Date of final decision : 12/01/2003

## Additional filing information

Planned Filing date:

Filing comments:

## Additional decision comments

## Final Decision History

Entered on 1-Dec-2003 by Rosalind Kennison  
File N/A 1-Dec-2003 Docket Family: SJO920030102

### Post Disclosure Text & Drawings

To add additional information related to this disclosure once it has been submitted, click the action button below and a new document will be opened for you to enter the new information. To view existing post disclosure information, double-click on the item in the list below (if there has been additional information entered), and the document will open for you to view.

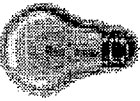
Date entered	Post disclosure comments and drawings (double-click an item below to view)
09/24/2003	Comments by John Thompson

### Disclosure History

Entered on 25-Sep-2003 by Rosalind Kennison (Dale M Crockatt as Responsible Attorney)  
Functional area changed from (66LA) Ng-Lamear-Creitz-66LA to (65DA) Ed Ng-65DA

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Form Revised (05/28/03)



**Post Disclosure Information**

Prepared for and/or by an IBM Attorney - IBM Confidential

Created By John Thompson On 09/24/2003 11:49:41 AM MDT

Last Modified By Rosalind Kennison On 09/25/2003 03:16:10 PM MDT

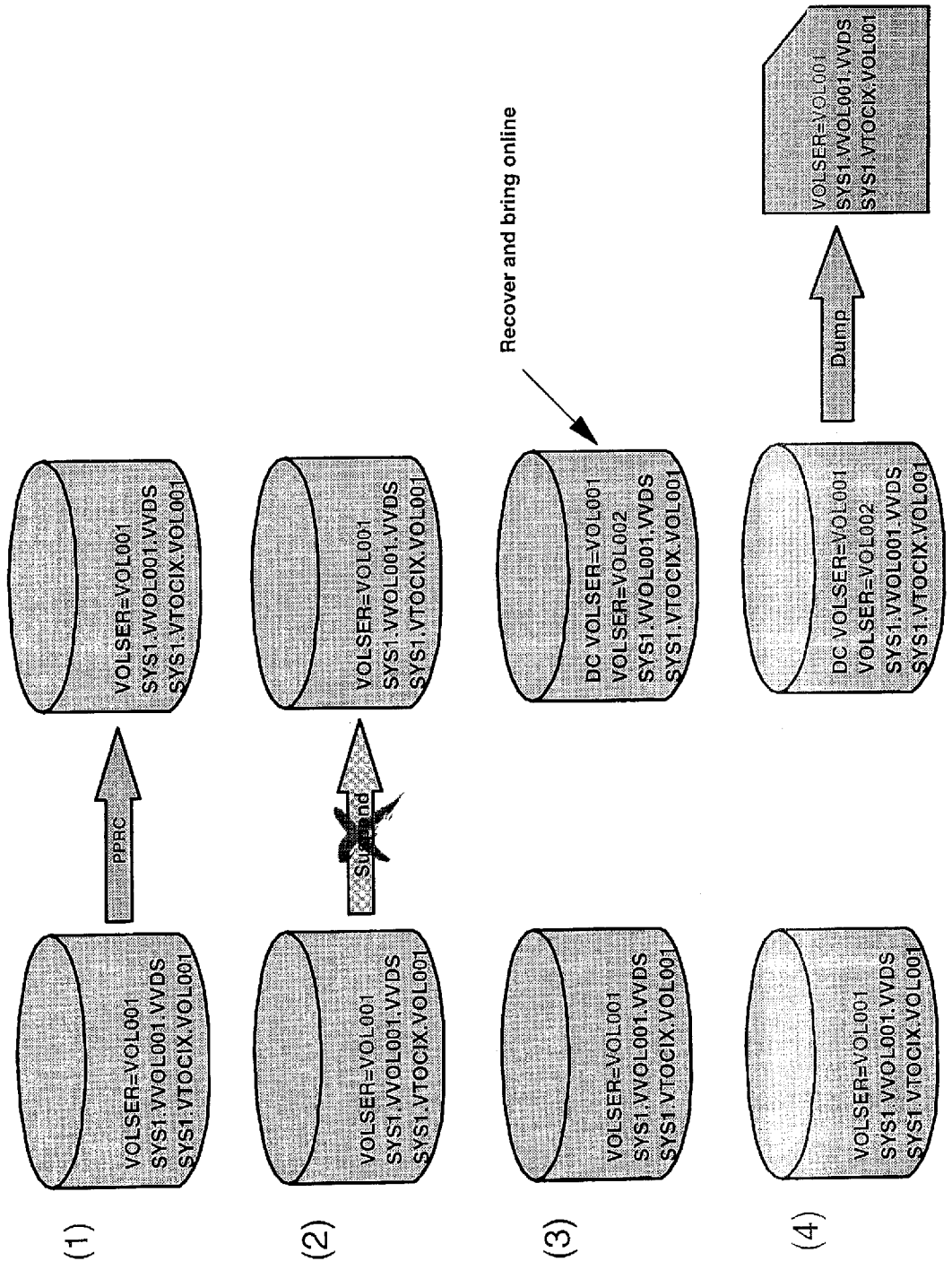
Required fields are marked with the asterisk ( <sup>\*</sup> ) and must be filled in to complete the form .

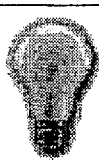
The following people are responsible for these comments John Thompson/Tucson/IBM



DC with PPRC.PRZ







# **Main Idea for Disclosure SJO8-2003-0165**

Prepared for and/or by an IBM Attorney - IBM Confidential

Archived On 10/17/2003 10:02:06 PM

## **Title of disclosure (in English)**

Backup by ID-suppressed mirroring then backup of target with ID reintroduced

## **Main Idea of disclosure**

1. Background: What is the problem solved by your invention? Describe known solutions to this problem (if any). What are the drawbacks of such known solutions, or why is an additional solution required? Cite any relevant technical documents or references.

In disk mirroring environments, users desire to temporarily suspend the mirroring and take a backup copy of the secondary volume, without impacting the applications' access to the primary volume. Since the secondary volume will have the same volser as the primary volume when the mirroring is suspended, the secondary cannot be brought online to the same system as the primary. To do so would cause a duplicate volser situation. So today, in order to back up the secondary volume, the user must do one of two things:

1. Bring the secondary device online to a different system and back it up from there. The disadvantage of this solution is that two systems are required, which is very costly.
2. Change the volser of the secondary to something other than the original volser, then bring it online to the same system as the primary and back it up from there. The disadvantage of this solution is that the backup copy will not have the original volser. When the backup is restored, the resulting volume will not have the original volser either. So, the user must remember the original volser that the backup was made from and manually set the volser back after the restore operation.

2. Summary of Invention: Briefly describe the core idea of your invention (saving the details for questions #3 below). Describe the advantage(s) of using your invention instead of the known solutions described above.

Then concept of saving the original volser in a different location on the secondary (or target) volume and reintroducing it during the backup operation, described by US Patent 6,557,089, is applied to mirroring environments.

3. Description: Describe how your invention works, and how it could be implemented, using text, diagrams and flow charts as appropriate.

In US Patent 6,557,089, a "dump conditioning" volser field is defined. This field is valid on the target volume of an instant virtual copy operation and it contains the volser of the source volume. This allows the target of the instant virtual copy operation to be brought online to the same system as the source volume. The backup process then uses this field to reintroduce the original volser during the backup.

In this invention, the use of the dump conditioning volser is applied to mirroring environments. When the volser of the secondary volume is changed so that it can be brought online (known as a "recover" processing in some mirroring solutions), the original primary volser is stored in the dump conditioning field of the secondary volume. This will allow the same backup processing introduced in US Patent 6,557,089 to reintroduce the original volser when the secondary volume is backed up.